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# Creating Arctic Carbon Lock-In: Case Study of New Oil Development in the South Kara Sea

Roman Sidortsov\*

*The overarching goal of this paper is to highlight the importance of considering the climate change implications of oil development in the Arctic. The current global climate change regime lacks universal emissions controls, thereby creating an opportunity for “carbon leakage.” Fossil fuels, no matter where extracted, find their way to countries that are not subject to mandatory emissions reductions. The recent rush to explore vast hydrocarbon resources in the Arctic may significantly contribute to the existing carbon lock-in. To illustrate the dangers of the Arctic carbon lock-in, this paper explores the development of new oil production capacity in the South Kara Sea in Russia.*

## I. Introduction

On 15 January 2011, British Petroleum (BP), the British oil supermajor, and Rosneft, the Russian oil champion, announced a stock swap deal to jointly develop 125,000 km<sup>2</sup> in the South Kara Sea.<sup>1</sup> As part of the deal, BP agreed to exchange 5 % of its stock for 9.5 % of Rosneft's shares.<sup>2</sup> However, BP was not the only major oil corporation interested in developing Russia's oil reserves. According to Rosneft's president, foreign oil executives were “lining up outside his office.”<sup>3</sup> Thus, no one was surprised when, after the BP-Rosneft deal fell through in May

2011, ExxonMobil replaced BP as Rosneft's partner in just three months.<sup>4</sup>

The BP-Rosneft deal exposed – yet again – the long-standing conflict between climate change and fossil fuel production.<sup>5</sup> Despite nearly universal recognition<sup>6</sup> of the climate change problem and its causal link to fossil fuel combustion, energy-related greenhouse gas (GHG) emissions and fossil fuel production continue to grow.<sup>7</sup> From 1990 to 2005, global GHG emissions increased by 26 %.<sup>8</sup> Carbon dioxide emissions grew by 31 % during the same period.<sup>9</sup> Yet, energy security<sup>10</sup> and pollution concerns<sup>11</sup> dominated the news coverage of the deal,

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1 Stephen Foley, “Russian State Oil Giant Takes \$7.8 bn Stake in BP”, The Independent, 15 January 2011, available on the Internet at <<http://www.independent.co.uk/news/business/news/russian-state-oil-giant-takes-78bn-stake-in-bp-2185228.html>> (last accessed on 17 January 2012).

2 *Ibid.*

3 Andrew Kramer and Clifford Krauss, “Russia Embraces Offshore Arctic Drilling”, New York Times, 15 February 2011, available on the Internet at <[http://www.nytimes.com/2011/02/16/business/global/16arctic.html?\\_r=1&pagewanted=1&hp](http://www.nytimes.com/2011/02/16/business/global/16arctic.html?_r=1&pagewanted=1&hp)> (last accessed on 17 January 2012).

4 “UPDATE 1-Exxon sees Russia Arctic Tax Terms ‘in Short Order’”, Reuters Africa, 16 September 2011, available on the Internet at <<http://af.reuters.com/article/commoditiesNews/idAFL5E7KG2P720110916?sp=true>> (last accessed on 17 January 2012).

5 Roman Sidortsov, “Measuring Our Investment in the Carbon Status Quo: Case Study of New Oil Production Development in the Russian Arctic” (unpublished manuscript, on file with author), at 11–13.

6 Decision 1/CP.17, Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, preamble, UN Doc. FCCC/CP/2011/9/Add.1, 15 March 2012.

7 U.S. Environmental Protection Agency, “Greenhouse Gases” (2010), at 13.

8 *Ibid.*

9 *Ibid.*

10 Sidortsov, “Measuring Our Investment in the Carbon Status Quo”, *supra*, note 5, at 7.

11 *Ibid.*

not the climate change consequences of the proposed Arctic oil and gas development. Few voices raised the climate theme, the very core of the issue. For example, Arild Skedsmo, head of World Wildlife Foundation Norway's Climate and Energy Programme, summarized his concerns in the following statement: "To avoid the worst consequences of climate change, we must phase out virtually all use of fossil fuel by 2050. This leaves very little room for any large-scale exploration and extraction of oil and gas in the Arctic."<sup>12</sup>

Despite the fact that BP and Rosneft did not close the deal, the following features of the failed partnership make it an ideal case study for exploring the conflict between energy and climate change policies. First, vast and largely undeveloped Arctic oil and gas resources make that region the world's last energy frontier. According to a U.S. Geological Survey (USGS) study, the Arctic holds 412,157.09 million barrels of oil equivalent (boe).<sup>13</sup> This amounts to 13% of the world's undiscovered oil, 30 % of its undiscovered natural gas, and 20 % of its undiscovered natural gas liquids.<sup>14</sup> Second, the announcement of the BP-Rosneft deal signified, according to many, the beginning of a large-scale exploration of the last energy frontier.<sup>15</sup> Third, oil is the lifeblood of today's economy; petroleum accounts for 32.8 % of energy consumption in the world.<sup>16</sup> Fourth, combustion of oil produces 37 % of the world's energy-related emissions.<sup>17</sup> Fifth, exploration and extraction activities in the Arctic will require significant financial investments and massive development of supporting infrastructure. The proposed activities

would have led to significant development on- and offshore with considerable climate change implications. Sixth, the BP-Rosneft deal was going to be implemented by a somewhat unique partnership. There is no doubt the three main players in the failed deal (i.e., BP and the U.K. and Russian governments) were pursuing the same economic interests in the proposed quest for Russian Arctic oil.<sup>18</sup> However, differences in British and Russian climate change policies could have led to a serious internal conflict in British society.

After ExxonMobil replaced BP as Rosneft's partner in August 2011, BP became the subject of harsh criticism in the media.<sup>19</sup> "Blow for BP" and "Black Eye for BP" were among the headlines describing BP's failure to tap into Russian Arctic oil resources.<sup>20</sup> This article challenges the media's rather one-sided assessment, and suggests that BP's shareholders may be better off not joining the economically and environmentally questionable Arctic expedition.

The overarching goal of this article is to emphasize the dangers of investing in oil development in the Arctic without fully considering the climate change implications of such development. The first section explores the shortcomings of the existing climate regimes in providing an effective solution to the climate change problem. The second section explains the carbon lock-in that oil development in the Russian Arctic will likely create. The third section uses the failed BP-Rosneft deal to provide an example of the duration and strength of a potential Arctic oil carbon lock-in.

12 Terry Macalister, "Exhausted Global Oil Supplies Make Arctic the New Hydrocarbon Frontier", *The Guardian*, 5 July 2011, available on the Internet at <<http://www.guardian.co.uk/environment/2011/jul/05/oil-supplies-arctic>> (last accessed on 17 January 2012).

13 U.S. Geological Survey, "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle" (2008), at 4.

14 U.S. Energy Information Administration, "Arctic Oil and Natural Gas Potential" (2009), at 6.

15 Foley, "Russian State Oil Giant Takes \$7.8 bn Stake in BP", *supra*, note 1. The South Kara Sea exploration is not the first attempt to explore hydrocarbon resources in the Arctic. For example, Statoil and Eni are currently developing the Goliat oil field in the Barents Sea. U.S. Energy Information Administration, "Countries: Norway", available on the Internet at <<http://www.eia.gov/countries/cab.cfm?fips=NO>> (last accessed on 17 January 2012).

16 International Energy Agency, "CO<sub>2</sub> Emissions From Fuel Combustion, Highlights" (Paris: IEA, 2011), at 6.

17 International Energy Agency, "2011 Key World Energy Statistics" (Paris: IEA, 2011), at 8.

18 Despite the fact that BP is a private company, it is closely tied with the U.K. government and British society. BP provides employment for thousands of Britons and contributes billions in tax revenue. See *infra*, pp. 10–11.

19 Jonathan Sibun, "Blow for BP as Rosneft, Exxon Mobil Sign Arctic Oil Deal", *The Telegraph*, 30 August 2011, available on the Internet at <<http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/8731228/Blow-for-BP-as-Rosneft-Exxon-Mobil-sign-Arctic-oil-deal.html>> (last accessed on 17 January 2012); Guy Chazan, "Exxon's Arctic Deal Is Black Eye for BP", *Wall Street Journal*, 31 August 2011, available on the Internet at <<http://online.wsj.com/article/SB1000142405311903352704576540702267428180.html>> (last accessed on 17 January 2012).

20 *Ibid.*

## II. Why the Global Mitigation Effort Is Failing: Flaws in the Current Climate Regime

Theoretically, mandatory reduction of CO<sub>2</sub> emissions will lead to a reduced demand for fossil fuels, which in turn will lead to a reduction in supply. Thus, if the ultimate goal is to reduce demand, there is no need to bother with reducing supply. However, this will only be true if control of the demand is truly universal. Otherwise, fossil fuels, no matter where extracted, will find their way to a country where they can be “converted” into CO<sub>2</sub> without any constraint imposed by international or domestic law. Mechanisms that focus on controlling supply of fossil fuels at the point of production could at a minimum reduce such “carbon leakage.” Current legal and regulatory mechanisms do not provide universal control of carbon emissions. Nor does the global climate regime regulate fossil fuel production to compensate for the lack of universal emissions controls.

The U.N. Framework Convention on Climate Change (UNFCCC) divides all participating countries into two camps: Annex I and non-Annex I.<sup>21</sup> Annex I Parties include industrialized nations that were members of the Organization for Economic Cooperation and Development (OECD) when the UNFCCC was signed in 1992 and former Soviet bloc states, represented by former Soviet republics and several Central and Eastern European nations.<sup>22</sup> Non-Annex I Parties are mostly developing nations, including forty-nine countries that are designated as least-developed countries (LDCs).<sup>23</sup> The UNFCCC places a greater burden on Annex I Parties to mitigate the effects of climate change.<sup>24</sup>

The Kyoto Protocol sets forth a far more significant difference in responsibilities between Annex I and non-Annex I countries. The Protocol sets binding GHG emissions reduction targets for thirty-

seven industrialized nations and the European Community.<sup>25</sup> Pursuant to the provisions of the Protocol, Annex I countries are the only parties responsible for reducing their national emissions.<sup>26</sup> Emissions trading, the Clean Development Mechanism (CDM), and Joint Implementation (JI) provide means for an Annex I country to achieve its target in cooperation with other countries.<sup>27</sup> Paradoxically, a reverse rule does not apply when an Annex I country finances, facilitates, and/or otherwise cooperates with a third country on a project that increases carbon emissions.

Although emissions reduction goals do not apply universally under the *current* international climate regime, recent negotiations of the UNFCCC Conference of Parties (COP) in Copenhagen (COP15), Cancun (COP16), and Durban (COP17) indicate that the status quo may not last forever. With a provision recognizing that the increase in global temperature should not exceed 2°C, the Copenhagen Accord appears to be a step toward universal obligations to cut carbon emissions.<sup>28</sup> However, the Accord generally continues the theme set forth in the Kyoto Protocol by imposing uneven emissions reduction responsibilities on Annex I and non-Annex I countries.<sup>29</sup> Under Article 4, Annex I countries agree “to implement individually or jointly the quantified economy-wide emissions targets for 2020.”<sup>30</sup> In contrast, non-Annex I countries agree to take mitigation actions, provided they receive financial and technical support from Annex I countries.<sup>31</sup> Even if the Copenhagen Accord were to require carbon emission reductions from both groups of countries, it remains a political and non-binding agreement.

The Cancun Agreements elaborate on many of the Copenhagen Accord’s provisions. For example, the Agreements confirm the 2°C goal and even entertain the possibility of a 1.5°C maximum increase over the pre-industrial global temperature.<sup>32</sup> Regarding non-Annex I countries, the Cancun

21 United Nations Framework Convention on Climate Change, “Parties & Observers”, available on the Internet at <[http://unfccc.int/parties\\_and\\_observers/items/2704.php](http://unfccc.int/parties_and_observers/items/2704.php)> (last accessed on 17 January 2012).

22 *Ibid.*

23 *Ibid.*

24 *Ibid.*

25 *Ibid.*

26 Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 10 December 1997, in force 16 February 2005, 37 *International Legal Materials* (1998), Annex B.

27 *Ibid.*, Arts. 6, 12, 17.

28 Decision 2/CP.15, Copenhagen Accord, UN Doc. FCCC/CP/2009/11/Add.1, 30 March 2010, para. 1.

29 *Ibid.*, Arts. 4, 5.

30 *Ibid.*, Art. 4.

31 *Ibid.*, Art. 5.

32 Decision 1/CP.16, The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention, UN Doc. FCCC/CP/2010/7/Add.1, 15 March 2011, para. 4.

Agreements essentially restate the emission reduction provisions from the Copenhagen Accord.<sup>33</sup>

Although more than 190 nations at the UNFCCC negotiations in Durban agreed to begin the process toward creating a new agreement that treats all nations equally, achieving such binding commitments will not be an easy task given the record of previous climate talks.<sup>34</sup> The debate on how to allocate GHG emissions reductions among Annex I and non-Annex I countries has often taken center stage in international negotiations. For example, China is the world's largest GHG emitter but refuses to take on binding commitments on equitable grounds.<sup>35</sup> In particular, in Copenhagen China argued first, that it did not cause the problem; second, that it lacks the capacity to deal with the problem without help from Annex I countries; and third, that the right to development trumps any concern for climate change.<sup>36</sup> Under this reasoning, the burden to mitigate the effects of climate change should continue to rest heavily on developed countries.<sup>37</sup> Further, developing nations should be required to participate in mitigation only with financial and technical assistance from developed countries.<sup>38</sup>

Although China is just one among many non-Annex I countries, several factors make its behavior a valid reason for concern. As noted above, China is the world's fastest growing economy and largest GHG emitter.<sup>39</sup> Additionally, the position of the Chinese government taken in Copenhagen as highlighted above leaves little doubt about the country's intentions.<sup>40</sup> Finally, as noted above, China is not alone in its opposition to binding and verifiable emission reduction goals. For example, India, the third largest GHG emitter and another rapidly developing economy, often sides with China on this issue. Thus, barring a drastic turnaround in China's position, nations will likely face an uphill battle

negotiating a new agreement based on common and shared responsibilities.

Many countries have enacted laws and promulgated regulations to implement their obligations under the Kyoto Protocol. The United Kingdom, like some other nations, went beyond its Kyoto goals and adopted more aggressive climate legislation.<sup>41</sup> The Russian Federation, on the other hand, largely has not.<sup>42</sup> Although the British and Russian climate regimes may be far apart in terms of their commitments to reducing domestic carbon emissions, they represent the global norm in terms of methodology.<sup>43</sup> Both follow the Kyoto approach and do little to address the out-of-state emissions that domestic companies help to generate by financing, operating, or hosting fossil fuel production.<sup>44</sup> Additionally, neither regime accounts for emissions "stored" in the fossil fuels that domestic companies produce.<sup>45</sup>

Based on the flaws of the current global climate regime identified above, one could reasonably conclude that this structure cannot serve as a foundation for achieving meaningful carbon reductions. First, emissions reduction goals do not apply universally, thereby creating a real possibility of "carbon leakage." Second, the regime does not regulate supply (production) of fossil fuels, including oil, to compensate for inadequate emission controls. Third, the regime does not take into account the economic interests that some Annex I nations (directly through export credit agencies or indirectly through national companies) have in investing in fossil fuel production. As a result, a state can, on paper, be fully committed to significant domestic reductions while providing financial and technical help to explore and extract oil and other fossil fuels that would be converted into GHG emissions in another country. Fourth, the regime does not account for economically and politically

33 *Ibid.*, paras. 9–12.

34 Decision 1/CP.17, *supra*, note 6, paras. 2–4.

35 Jing Cao, "Reconciling Human Development and Climate Protection: A Multistage Hybrid Climate Policy Architecture", in Joseph Aldy and Robert Stavins (eds), *Post-Kyoto International Climate Policy* (Cambridge: Cambridge University Press, 2010) 563, at 570.

36 People's Republic of China, National Development and Reform Commission (NDRC), "Implementation of the Bali Roadmap: China's Position on the Copenhagen Climate Change Conference", 20 May 2009, available on the Internet at <[http://en.ndrc.gov.cn/newsrelease/t20090521\\_280382.htm](http://en.ndrc.gov.cn/newsrelease/t20090521_280382.htm)> (last accessed on 17 January 2012).

37 *Ibid.*

38 *Ibid.*

39 CO<sub>2</sub> Emissions, *supra*, note 16, at 9.

40 China's Position, *supra*, note 37.

41 Sidortsov, "Measuring Our Investment in the Carbon Status Quo", *supra*, note 5, at 26–28.

42 *Ibid.*, at 28–31.

43 *Ibid.*, at 26–31.

44 *Ibid.*

45 *Ibid.*

influential non-government actors whose commercial existence depends on fossil fuel production.

The fact that over 190 nations agreed in Durban to negotiate a new global climate agreement does not guarantee that an agreement will actually be reached. As recent history clearly shows, climate negotiations are a fragile process where things can go wrong at any given moment. China could stick to its past position or, if elected, a republican U.S. president may refuse to sign a new agreement.<sup>46</sup> Additionally, the nine years leading to the new agreement's entry into force gives politicians enough time to adopt national policies that would make ratification or meaningful implementation of the new agreement difficult.<sup>47</sup> A real possibility exists for some nations to treat these nine years as their last carbon feast before a long famine. Notwithstanding the potential pitfalls, the possibility of a global climate agreement imposing universal climate controls has increased drastically after Durban. After all, this is the first time the parties agreed to do so.<sup>48</sup>

### III. Creating Arctic Oil Carbon Lock-In, Path Dependence, Stickiness, and Inertia

The decision to invest in developing Russian Arctic oil resources now will shape a wide range of decisions in the future. Failure to consider consequences of such a major undertaking will create a strong incentive to keep developing oil resources until the investment is recouped while ignoring the climate problem, even when it becomes much more acute.

Continuing to operate under conditions that are no longer valid is a phenomenon known as "path dependence." The gist of this concept is that initial conditions influence outcomes.<sup>49</sup> "Stickiness" and "inertia", other terms frequently used to describe path dependence, often lead to positive feedback loops within the system.<sup>50</sup> Path dependence becomes a self-perpetuating process, and the whole system becomes resistant to change.<sup>51</sup> As a result, "[s]ocieties that get 'stuck' embody belief systems and institutions that fail to confront and solve new problems of societal complexity."<sup>52</sup>

Path dependence is prevalent in the energy sector<sup>53</sup> perpetuated by large-scale investments in energy infrastructure.<sup>54</sup> The fossil fuel component of energy systems has prompted some authors to use the term "carbon lock-in" in relation to energy path dependence.<sup>55</sup> This term is often used to describe the barriers to transitioning to a low-carbon economy when society remains stuck in a carbon rut.<sup>56</sup> Such studies are frequently focused on the decisions that were made before climate change became a prominent public policy topic.<sup>57</sup> The discussion revolves around untangling the myriad vested interests and overcoming the legacy of the decisions made in the *past*.<sup>58</sup> Because oil development in the Russian Arctic continental shelf at large has not started, we are witnessing a situation in which decisions are made *presently*. Today, a broad range of analysts and policymakers, including the world's leading energy experts, recognize that climate change implications should factor into decisions regarding building the world's energy future.<sup>59</sup> After all, according to the International Energy Agency, the efforts of keeping

46 Nearly all 2012 republican front-runners for U.S. president deny or downplay the problem of climate change. Timothy Hurst, "Republican Presidential Candidates on Climate Change", 22 August 2011, available on the Internet at <<http://ecopolitology.org/2011/08/22/republican-presidential-candidates-on-climate-change> (last accessed on 17 January 2012).

47 The new agreement is scheduled to be signed by 2015 and enter into force by 2020. Decision 1/CP.17, *supra*, note 6, para. 4.

48 *Ibid.*, at preamble.

49 Andreas Goldthau and Benjamin Sovacool, "The Uniqueness of the Energy Security, Justice, and Governance Problem", 41 *Energy Policy* (2012), 232, at 234.

50 *Ibid.*

51 *Ibid.*

52 Douglas C. North, Prize Lecture, Economic Performance Through Time, 9 December 1993, available on the Internet at

<[http://www.nobelprize.org/nobel\\_prizes/economics/laureates/1993/north-lecture.html](http://www.nobelprize.org/nobel_prizes/economics/laureates/1993/north-lecture.html) (last accessed on 17 January 2012).

53 Goldthau and Sovacool, "The Uniqueness of the Energy Security, Justice, and Governance Problem", *supra*, note 49, at 234.

54 *Ibid.*

55 *Ibid.* Because the term "carbon lock-in" refers specifically to the fossil fuel legacy of the energy sector, I use this term for the remainder of this article.

56 Marilyn A. Brown *et al.*, "Carbon Lock-In: Barriers to Deploying Climate Change Mitigation Technologies" (Oak Ridge, Tenn.: Oak Ridge National Laboratory, 2008).

57 *Ibid.*

58 *Ibid.*

59 International Energy Agency, *World Energy Outlook 2010* (Paris: IEA, 2010), at 46.

Earth's temperature under 2°C should drive oil demand down.<sup>60</sup>

However, projected increases in oil demand, rather than climate change-related constraints on oil production, appears to be the dominant assumption upon which BP, Exxon Mobil, and Shell base their decisions to explore the Arctic.<sup>61</sup> The general consensus among the oil supermajors regarding the increase in global oil demand during the next 20 years corresponds to the goal and expectation of the Russian Federation to satisfy the demand. The Energy Strategy of the Russian Federation sets "meeting the global demand for oil and petroleum products" as a strategic goal for the development of the Russian oil industry.<sup>62</sup>

Forecasts of an increased demand for oil coupled with plans to meet that demand provide a dangerous basis for the decision to invest in oil exploration and extraction in the Arctic. The basis for this decision appears to be omitting an important factor – climate change-related constraints on oil production. Failure to incorporate this already visible and present condition will not only create a financial rut – Arctic oil carbon lock-in – it will also set the course for a painful collision between the chosen path and a condition that will become too dangerous to ignore.

## IV. Sizing Up the Arctic Oil Carbon Lock-In

### 1. The Duration of the Arctic Oil Carbon Lock-In

Securing oil for today and tomorrow does not mean that the valve can be shut off the day after tomorrow without serious socio-economic consequences. Investing in exploratory drilling usually has much

higher sunk costs than simply investing in seismic studies. Additionally, developing a small field that is part of a large, already-developed area (*e.g.* the North Sea) will have a different carbon lock-in effect than in a virtually unknown region (*i.e.* the South Kara Sea). In the latter case, most of the supporting infrastructure and exploration and extraction logistics will have to be created from scratch, requiring a greater investment. Finally, the duration of exploration and extraction can also play a large role in the duration and strength of the carbon lock-in. In sum, the degree and term of carbon lock-in depends on 1) total sunk costs of the undertaking; 2) how far along in the process parties are; 3) estimated resources; 4) the horizontal scope of the undertaking; and, 5) the economic, political, and technical restraints on the term of the undertaking.

Arctic oil will be expensive to find, lift, and deliver. The sunk costs of South Kara Sea oil development could be as high as \$500 billion.<sup>63</sup> Pursuant to the U.S. Energy Information Administration, "[f]inding large Arctic oil and natural gas deposits is difficult and expensive; developing them as commercially profitable ventures is even more challenging."<sup>64</sup> Additionally, oil and gas exploration and extraction in the Arctic require deploying cutting edge technology, which comes at a high cost.<sup>65</sup> Technical, environmental, and logistical difficulties also lead to higher capital costs.<sup>66</sup> All these factors may push the price of Arctic oil to over \$100 per barrel.<sup>67</sup> If the South Kara Sea project proceeds as intended, the total cost of South Kara Sea oil development may exceed the initial \$3.2 billion more than a hundred times.<sup>68</sup>

Had it succeeded, the BP-Rosneft joint venture would have started its activities in the very beginning of the exploration process. Three license blocs in the South Kara Sea – EPNA 1, 2, and 3 – have

60 *Ibid.*, at 444.

61 British Petroleum, "Energy Outlook 2030" (London: BP, 2012), at 29; ExxonMobil, "The Outlook for Energy: A View to 2030" (Irving, Tx: 2009), at 40; Shell International BV, "Shell Energy Scenarios to 2050" (The Hague: Shell International, 2008), at 17, 3.

62 Energeticheskaya Strategiya Rossii na Period do 2030 Goda [The Energy Strategy of Russia for the Period Ending in 2030], 13 November 2009, at 42.

63 Yuri Humber and Stephen Bierman, "Exxon Confident of Right to Book Russian Arctic Oil Reserves", Bloomberg, 27 September 2011, available on the Internet at <<http://www.bloomberg.com/news/2011-09-27/exxon-confident-it-can-book-oil-reserves-in-russian-arctic.html>> (last accessed on 17 January 2012).

64 U.S. Energy Information Administration, "Arctic Oil and Natural Gas Potential", *supra*, note 14, at 6.

65 David Cohen, "Arctic Dreams", Energy Bulletin, 25 April 2007, available on the Internet at <<http://www.energybulletin.net/node/29151>> (last accessed on 17 January 2012).

66 U.S. Energy Information Administration, "Arctic Oil and Natural Gas Potential", *supra*, note 14, at 6.

67 Christoph Seidler, "The Exorbitant Dream of Arctic Oil", Spiegel, 26 January 2011, available on the Internet at <<http://www.spiegel.de/international/business/0,1518,741820,00.html>> (last accessed on 17 January 2012).

68 It is important to note that ExxonMobil pledged \$3.2 billion for both the South Kara Sea and Black Sea exploration projects. Humber and Bierman, "Exxon Confident of Right to Book Russian Arctic Oil Reserves", *supra*, note 63.

largely not been studied. In fact, the type of license that Rosneft claims to possess was issued by Rosneft, the Russian oil exploration and licensing agency, for that exact purpose.<sup>69</sup>

The estimated size of the South Kara Sea resources could make this undertaking one of the largest offshore developments in the world. If the estimate is any indication of potential proven reserves, it is easy to understand why BP made an aggressive play for EPNA 1, 2, and 3. According to Rosneft, the field's resources are estimated at 16 billion tons of oil equivalent (toe) (114.36 billion boe),<sup>70</sup> with up to 5 billion tons of oil (35.74 billion barrels).<sup>71</sup> Even if the actual resources are only one-tenth of the estimate, the South Kara Sea reserves will dwarf the two largest Norwegian Arctic fields, Skrugart and Goliat, combined, by a factor of seven.<sup>72</sup>

The horizontal scope of the undertaking promises to be massive.<sup>73</sup> The northern territories of the country adjacent to the prospective oil fields remain largely undeveloped.<sup>74</sup> Because none of the discovered Arctic offshore oil and gas fields has started producing, the infrastructure to support offshore oil and gas virtually does not exist.<sup>75</sup> Thus, development of Russian offshore oil fields will require a significant investment in a number of areas, ranging from sea ports to helicopter pads.

Based on comparisons with compatible oil development projects in the Russian Arctic and the North Sea, the South Kara Sea development could go on for at least twenty-five to forty years. The Prirazlomnoe oil field was discovered in the Pechora

Sea in 1989,<sup>76</sup> and is scheduled to start commercial production in 2011.<sup>77</sup> The fact that it has taken the operators twenty-two years to start extraction can be attributed to the break-up of the Soviet Union and the ensuing economic turmoil in Russia.<sup>78</sup> Additionally, the current operator is employing rather sophisticated technology that took several years to develop and implement, which further stalled extraction. The ice-resistant Pirazlomnaya platform is expected to extract oil from the 610 million barrel field for about twenty-two years.<sup>79</sup> This term is in line with the average twenty- to thirty-year production term for most U.K. and Norwegian North Sea fields that went into production in the 1970s and 1980s.<sup>80</sup>

Even a cursory analysis of the identified five factors suggests that every step toward developing Russian Arctic resources will produce significant sunk costs and create carbon lock-in that would deepen with every additional step for twenty-five to forty years.

## 2. The Role of State and Non-State Actors in Strengthening the Arctic Carbon Lock-In

When BP and Rosneft agreed to join forces in January 2011, Vladimir Putin called the deal "an alliance based on mutual advantage."<sup>81</sup> The Russian Prime Minister underscored the fact that the parties had common interests in developing the South Kara Sea that they could only achieve together. The mutual

69 Rosneft, *Arkticheskie Morya Rossii* [Russian Arctic Seas], available on the Internet at <[http://www.rosneft.ru/Upstream/Exploration/arctic\\_seas/](http://www.rosneft.ru/Upstream/Exploration/arctic_seas/)> (last accessed on 17 January 2012); Betsy Baker et al., "Arctic Offshore Oil and Gas Guidelines in Greenland and the Russian Federation, Arctic Offshore Oil and Gas Guidelines" (2011), at 53, available on the Internet at <[http://www.vermontlaw.edu/Documents/IEE/20110215\\_IEE-BakerWP5.pdf](http://www.vermontlaw.edu/Documents/IEE/20110215_IEE-BakerWP5.pdf)> (last accessed on 17 January 2012).

70 Russian Arctic Seas, *supra*, note 69.

71 "Bolshoi Petroleum", 17 January 2011, available on the Internet at <<http://www.oilru.com/news/227118/>> (last accessed on 17 January 2012).

72 U.S. Energy Information Administration, "Countries: Norway", *supra*, note 15.

73 "Rossijskij Uchenyj: Perechen Zayavok 'Gazproma' i 'Rosnefti' na Polucheniya Arkticheskikh Litsenziy ne Obespechivaet Namechennyh Rubezhej Dobychi i Podgotovki Zapasov [Russian Scientists: The Number of License Applications from Gazprom and Rosneft Does not Translate into Meeting the Requirements of the Planned Output]", *Neft Rossii* [Russia's Oil], 25 February 2011, available on the Internet at <<http://www.oilru.com/news/236640/>> (last accessed on 17 January 2012).

74 Elena Andreeva and Valery Kryukov, "The Russian Model: Merging Profit and Sustainability", in Aslaug Mikkelsen and Oluf Langhelle (eds), *Arctic Oil and Gas: Sustainability at Risk?* (Abingdon: Routledge, 2008), at 241–42.

75 Russia's Oil, "Russian Scientists", *supra*, note 73.

76 "Prirazlomnoye Oilfield - Russian Federation", available on the Internet at <<http://www.offshore-technology.com/projects/Prirazlomnoye/>> (last accessed on 17 January 2012).

77 "Prirazlomnoe Oil Field", available on the Internet at <<http://www.gazprom.com/production/projects/deposits/pnm/>> (last accessed on 17 January 2012).

78 Prirazlomnoye Oilfield, *supra*, note 77.

79 *Ibid.*

80 Roger D. Blanchard, *The Future of Global Oil Production: Facts, Figures and Projections, by Region* (Jefferson, N.C.: McFarland & Company, 2005), at 58–59, 64.

81 Foley, "Russian State Oil Giant Takes \$7.8 bn Stake in BP", *supra*, note 1.



advantage, the common economic goal, would have strengthened an alliance that already consisted of two powerful nations and the fourth largest company in the world.<sup>82</sup> Additionally, the Arctic oil carbon lock-in, fortified by the long term systemic interaction among BP (the non-state actor), the U.K. (the domicile country), and Russia (the host country), would have been on a collision course with the visible willingness of these actors to combat climate change.<sup>83</sup>

#### a. The Non-State Actor (BP)

BP, as any oil company, is in the business of producing and selling oil and petroleum products. Thus, it is reasonable to assume that the company's shareholders recognize that their dividend depends on how well the company finds, lifts, transports, processes, and sells oil and petroleum products to consumers. Theoretically, company employees should have the same expectations regarding their job security. Clearly, this is an oversimplification of why people choose to invest or work in the petroleum industry or for a specific company. Otherwise, BP would not be spending billions of dollars on its "Beyond Petroleum" campaign.<sup>84</sup> However, no matter what the motivations are, shareholders and employees of an oil company want their company to succeed. And the definition of success does not include absorbing the sunk cost of a project the company needs to cancel before the project has paid for itself.

To illustrate this point, consider the following hypothetical. Suppose that the BP-Rosneft deal had gone through and the international community kept its promise to adopt a new climate agreement based on universal emissions controls. This measure would have rendered South Kara Sea oil less competitive. BP's shareholders and employees would face the dilemma of supporting new climate change action at the expense of their financial security. It is safe to assume that at least some of the shareholders and employees otherwise concerned about climate change would choose to avoid financial loss. Given the fact that support for the climate measure would result in a certain detriment (e.g., financial loss, loss of a job, etc.) while offering an uncertain benefit (e.g., the measure may not be enough to stop rapid climate change), the non-supporters group may be big enough to kill the measure domestically.

Many BP investors and employees faced a similar dilemma following the BP oil disaster in the Macondo Prospect. In the summer of 2010, President Obama secured \$20 billion from BP to cover environmental damage caused by the accident while not closing the door to additional contributions from the company.<sup>85</sup> It is hard to imagine that BP shareholders and employees wished for the gigantic oil slick to remain floating in the Gulf of Mexico. Yet, shareholder pressure triggered by the company's suspension of dividend payments due to the mounting cleanup costs prompted BP to object to the lack of an environmental liability cap. The company even enlisted British Prime Minister David Cameron to publicly lobby on its behalf.<sup>86</sup>

#### b. The Domicile Country (U.K.)

Mr. Cameron's appeal to President Obama highlights the interest the British government has in BP's economic status. U.K. shareholders own 44 % of the company.<sup>87</sup> Approximately 18 million Britons own BP's stock either individually or through a pension fund.<sup>88</sup> London Mayor Boris Johnson responded to the rapid decline in value of BP's stock in 2010, saying "[w]hen you consider the huge exposure of British pension funds to BP it starts to become a matter of national concern."<sup>89</sup> According

82 "Global 500", available on the Internet at <[http://money.cnn.com/magazines/fortune/global500/2011/full\\_list](http://money.cnn.com/magazines/fortune/global500/2011/full_list)> (last accessed on 17 January 2012).

83 Goldthau and Sovacool, "The Uniqueness of the Energy Security, Justice, and Governance Problem", *supra*, note 49, at 234.

84 Anne Landman, "BP's 'Beyond Petroleum' Campaign Losing its Sheen", PRWatch, 3 May 2010, available on the Internet at <<http://www.prwatch.org/node/9038>> (last accessed on 17 January 2012).

85 James Kirkup, "Oil Spill: David Cameron Confronts Barack Obama in Battle to Protect BP", The Telegraph, 16 June 2010, available on the Internet at <<http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/7834242/Oil-spill-David-Cameron-confronts-Barack-Obama-in-battle-to-protect-BP.html>> (last accessed on 17 January 2012).

86 *Ibid.*

87 BP, "Ownership Statistics", available on the Internet at <<http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9010453&contentId=7019612>> (last accessed on 17 January 2012).

88 Anthony Reuben, "Why is BP Important to the UK Economy?", BBC, 10 June 2010, available on the Internet at <<http://www.bbc.co.uk/news/10282777>> (last accessed on 17 January 2012).

89 *Ibid.*

to BP, in 2009 every £1 of every £7 paid to a pension fund by FTSE top 100 companies was in the form of a dividend paid by BP.<sup>90</sup>

As of June 2010, the company employed 10,105 people in the U.K.<sup>91</sup> Although BP's domestic employment many not seem very impressive compared to other countries where it operates (BP employed more than twice as many people in the United States in 2010), its tax contributions in the U.K. are very significant.<sup>92</sup> In 2006–2008, BP paid £1.7 billion (\$2.8 billion) in profits tax.<sup>93</sup> The total tax contribution paid by the company and its employees to the U.K. revenue in 2009 was £5.8 billion (\$9.55 billion).<sup>94</sup>

Such a tight connection between BP and the U.K. government may call into question the prospects for an aggressive British climate change policy. The government may opt not to risk the loss of tax revenue and avoid public outcry over lost dividends if BP is faced with abandoning a project with high sunk cost. As a result, BP as the non-state actor and the U.K. as the domicile state would form a formidable alliance that depends upon maintaining the carbon status quo.

### c. The Host Country (Russia)

Russia is the world's largest oil and second-largest natural gas producer.<sup>95</sup> Russia is also the world's leader in energy exports.<sup>96</sup> In fact, its recent economic growth is almost exclusively attributable to oil and gas exports.<sup>97</sup> Currently, oil and gas production and exports are as indispensable to Russia's economy and geo-political aspirations as vodka is to

a Russian festive dinner. Oil and gas are the country's primary means of survival and basis for reclaiming its relevance in the world. As Marshall Gordon's book suggests, Russia is a "petrostate."<sup>98</sup>

Oil exports have played a significant role in the Russian economy for over 100 years.<sup>99</sup> In the 1960s and 1970s, the increase in petroleum output followed by the increase in exports of oil and petroleum products gave the Soviet leadership a powerful diplomatic weapon to spread its influence among newly decolonized countries. Currently, more than half of Russia's revenues come from the oil and gas sector.<sup>100</sup> To hedge against oil price volatility, Russia created the Stabilization Fund, which gets replenished and drained as oil prices go up and down.<sup>101</sup> In 2007, the Russian government amassed formidable rainy day financial reserves in the form of \$120 billion in the Stabilization Fund and \$420 billion in the treasury and Central Bank.<sup>102</sup> According to Gordon, oil exports provided Russia the wherewithal to reach this level of financial stability.<sup>103</sup>

Unsurprisingly, Russia was one of the hardest hit economies in late 2008.<sup>104</sup> To slow devaluation of the ruble and avoid economic collapse, Russia spent one third of its foreign currency reserves.<sup>105</sup> In the first quarter of 2011, the oil revenue dependence pattern repeated itself; high oil prices again boosted Russia's economic growth.<sup>106</sup>

Although attempts have been made to introduce diversity into the Russian economy, none has posed a serious challenge to Putin's energy superpower blueprint.<sup>107</sup> For example, Russia's then-president, Dmitry Medvedev, called the country's dependence

90 *Ibid.*

91 *Ibid.*

92 *Ibid.*

93 *Ibid.*

94 *Ibid.*

95 U.S. Energy Information Administration, "Countries: Russia", available on the Internet at <<http://www.eia.gov/countries/cab.cfm?fips=RS>> (last accessed on 17 January 2012).

96 U.N. Development Programme, "National Human Development Report in the Russian Federation 2009: Energy Sector and Sustainable Development" (New York, N.Y.: UNDP, 2010), at 15.

97 *Ibid.*

98 Marshall Goldman, *Petrostate: Putin, Power, and the New Russia* (Oxford: Oxford University Press, 2010).

99 *Ibid.*, at 11–12.

100 "FACTBOX-Key Political Risks to Watch in Russia", Reuters Africa, 4 August 2011, available on the Internet at <<http://af.reuters.com/article/energyOilNews/idAFRISKRU20110804?sp=true>> (last accessed on 17 January 2012).

101 Goldman, *supra*, note 98, at 91.

102 *Ibid.*

103 *Ibid.*

104 Central Intelligence Agency, "The World Factbook: Russia", available on the Internet at <<https://www.cia.gov/library/publications/the-world-factbook/geos/rs.html>> (last accessed on 17 January 2012).

105 *Ibid.*

106 *Ibid.*

107 Goldman, *Petrostate: Putin, Power, and the New Russia*, *supra*, note 98, at 97.

on fossil fuel exports “humiliating.”<sup>108</sup> But even he had to tone down his modernization rhetoric in light of the upcoming presidential election battle, as promises to keep gasoline prices low appear to resonate better with Russian voters.<sup>109</sup> Embedded in every phase of the Russian modern reality, reliance on oil exports is unlikely to change anytime soon.

Russia’s economic and geo-political resurgence fueled by oil exports came at an environmental and social price. The United Nations Development Programme pointed out that “environmental pollution caused by the energy segment is a serious health hazard.”<sup>110</sup> Overdevelopment of the fuel and energy sectors resulted in “energy and environmental malaise.”<sup>111</sup> Income inequality remains an acute problem in Russia, and the newfound oil wealth did not provide a solution.<sup>112</sup> Yet, most importantly for this study, Russia’s dependence on oil production makes it ideologically opposed to a meaningful climate change action. The impact of the 10.7 million barrels of oil a day that it currently produces overshadows its domestic emissions.<sup>113</sup>

The main goal of this subchapter is not to criticize Russia’s dependence on oil; it is to contrast Russia’s real position on climate change with the U.K.’s. Although these positions are fundamentally different, the U.K. government and the 18 million British BP shareholders would have found themselves allied with Russia on the climate issue if the deal had gone through. Such an alliance would have ensured the longevity of the carbon lock-in in the Russian Arctic while pitting British economic interests against its progressive climate policy.

## V. Conclusion

The failure of the current climate regime to provide a universal clamp on the growth of GHG emissions has prompted governments and non-state actors to

plan for ever-increasing fossil fuel production capacity. Every step in this direction perpetuates the carbon lock-in and puts a new shared-responsibilities climate agreement in jeopardy. The South Kara Sea project is just one example of this tendency. If the BP-Rosneft deal had succeeded, oil development in the South Kara Sea would have contributed to the existing carbon lock-in by adding a tight and strong dependence sub-system. Climate change is too dangerous of a problem to ignore both for economic and environmental reasons. Therefore, the new oil explorers of the Arctic should give climate change effects careful consideration before embarking on the treacherous Arctic oil expedition.

108 Paul Abelsky and Anna Ulaeva, “Russia Sees Oil, Gas Share of GDP Falling to 14 % (Update 1)”, Bloomberg, 22 January 2010, available on the Internet at <[http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aCfUrLO\\_ySjc](http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aCfUrLO_ySjc)> (last accessed on 17 January 2012).

109 “Medvedev Vystupil v Skolkovo [Medvedev Spoke in Skolkovo]”, Rossijskaya Gazeta, 18 May 2011, available on the Internet at <<http://www.rg.ru/2011/05/18/mevedev-stenogr-site.html>> (last accessed on 17 January 2012).

110 U.N. Development Programme, “National Human Development Report”, *supra*, note 96, at 9.

111 *Ibid.*, at 11.

112 *Ibid.*, at 110.

113 International Energy Agency, “Oil Market Report Oil Production: Russia 5 Year Range”, available on the Internet at <[http://omrpublic.iea.org/supply/ru\\_to\\_ov.pdf](http://omrpublic.iea.org/supply/ru_to_ov.pdf)> (last accessed on 17 January 2012).

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